

Urban planning as a tool to cope with climate change. Cooperation between the University of Lisbon and the Municipality

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Climate change is a current and urgent topic. Urban areas are particularly vulnerable to climate change due to the concentration of population, infrastructures and activities and to their specific climatic features, for example the urban heat island. In certain cities, temperature has already risen to values predicted for the planet's mean temperature in 2100. Some questions arise: Is there a direct or indirect effect of urban warming upon planetary climate change? What are the consequences of global warming to the urban heat island? What can be done to cope with climate change impacts in urban areas without compromising their sustainability, that is, to minimise the impacts upon the environment while maintaining the quality of life of urban dwellers?

On the other hand, cities have the potential (in terms of critical mass and technology) to promote innovative solutions that are easily reproducible on a wider scale. The great concentration of resources may, in certain cases, improve our capacity to take the most appropriate action. In cities, there are potentially less obstructions to the implementation of measures and to decision making than at a national and global level. So, the main question is: should we not consider cities as privileged places to test different types of adaptation to climate change? We are still at an initial stage in the development of a global answer to the threat of climate change and in this sense cities can be an advantageous starting point.

Lisbon's case will be presented. Geographers from the University of Lisbon have worked together with the Municipality of Lisbon and have studied Lisbon's urban climate in order to give spatialized climate guidelines, both for the whole city and at a city district level. The mapping of Lisbon's physical features was done using a Geographical Information System. A "ventilation map" was produced using a Digital Terrain Model and data of urban roughness. A "built-density" map was also prepared based on the analysis of a Landsat image and field work. By crosstabulating these two layers, a final map depicting Lisbon's "homogeneous climatic-response units" was prepared and can be consulted at the Municipality site (http://pdm.cm-lisboa.pt/pdf/RPDMlisboa_avaliacao_climatica.pdf). Finally, a series of climatic guidelines for planning were put forth for the different units and are to be included in the next version of the Master Plan. Subsequently, a city district microclimatic study is being carried out in a fast growing urban area north of Lisbon. Climate guidelines have also been put forth. The increase of vegetation in certain areas, the improvement of green spaces, the adequate disposal of new buildings in relation to wind and solar radiation are some of the outlined measures. The application of adaptation measures to climate change in urban areas contribute, at the same time, to an improved urban environment with benefits on energy consumption, air quality, comfort and human health, among others.